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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/553,374	04/20/2000	Edward S. Ellis	GJH-0019	5094

7590

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EXAMINER

JOHNSON, JERRY D

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 02/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

*SW*

## Office Action Summary

Application No.

09/553,374

Applicant(s)

ELLIS ET AL.

Examiner

Jerry D. Johnson

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-7 and 9-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other:  |

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, 9-15 and 18-26 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harrison et al.

Harrison et al, U.S. Patent 5,292,428, teach a process wherein hydrocarbon feedstock is passed through two or more hydrodesulfurization zones and connected in a series each containing a packed bed of solid catalyst. The liquid is passed from the first zone to the next until the final zone. Make up hydrogen is supplied to a hydrodesulfurization zone (i) other than the first hydrodesulfurization zone; hydrogen-containing gas is recovered from each hydrodesulfurization zone. The first hydrodesulfurization zone is supplied with hydrogen-containing gas recovered from a subsequent hydrodesulfurization zone (abstract). If the feedstock is, for example a diesel feedstock then the reaction conditions used in the process will typically be chosen to reduce the residual sulphur content to about 0.5 wt % S or less, e.g. about 0.3 wt % S or less, even down to about 0.05 wt % S or less and to reduce the aromatics content

to about 27 volume % or lower, e.g. to about 20 volume % or less (column 9, lines 35-41).

There will be used an amount of hydrogen which is equivalent to at least the stoichiometric amount of hydrogen required to desulphurise the feedstock and to achieve the desired degree of dearomatisation. Normally it will be preferred to use at least about 1.05 times such stoichiometric amount of hydrogen (column 10, lines 3-9). The process can be carried out in a plant having two hydrodesulphurisation zones or in one having more than two such zones, for example 3, 4, 5, or more (column 10, lines 22-25). Depending on the nature of the feedstock and the temperature profile through the reaction stages of the plant and upon the relative volumetric flows of liquid and gas, the degree of desulphurisation in the latter stages of the reaction and the H<sub>2</sub>S level may allow for a subsequent stage or stages to be added, operating at essentially the same pressure as the rest of the hydrodesulphurisation plant, but aimed at aromatics saturation. In this case the fresh hydrogen-containing gas is fed to the aromatics hydrogenation stage or stages and then to the rest of the hydrodesulphurisation plant (column 15, lines 31-41). Different hydrodesulphurisation conditions may be used in different zones (column 10, lines 26-65). In column 18 of Harrison et al, Tables 1-3, heavy gas vacuum oil feedstock having 2.23 weight % sulphur content is converted to a product having 31 ppm S and 15.9 vol % aromatics.

Accordingly, Harrison et al teach a process and composition which reasonable appears to be either the same as or an obvious variation of the instantly claimed product and composition. Applicants' claims if not anticipated by 35 U.S.C. § 102, would be obvious under 35 U.S.C. § 103.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison et al in view Haun et al.

Harrison et al is relied on as above but differ from the instant claims in not teaching a countercurrent aromatics hydrogenation stage or stripping of the liquid stage prior to the aromatics stage.

Haun et al, U.S. Patent 5,114,562, is relied on as teaching countercurrent aromatics hydrogenation and stripping of the liquid stage prior to the aromatics stage, i.e, Haun et al teach a mineral oil conversion process which includes hydrodesulfurization and hydrogenation steps performed in separate reaction zones. The subject invention specifically relates to the hydrogenation of distillate petroleum fractions to produce low sulfur content products including diesel fuel and jet fuel (column 1, lines 7-13). The feedstock could include virtually any middle distillate (column 4, lines 5-6). Desulfurization conditions employed are those customarily employed in the art for desulfurization of equivalent feedstocks (column 4, lines 29-31). The effluent stream of the desulfurization zone is stripped with a stream of hydrogen-rich gas prior to being fed to the hydrogenation zone (column 6, lines 36-47). The vapor phase portion of the reaction zone effluent stream is partial condensed and the hydrocarbon fraction is preferably passed into the hydrodesulfurization zone to ensure its complete desulfurization (column 6, line 60 to column 7, line 16). The vapor phase stream from the hydrogenation step is highly rich in hydrogen and relatively low is hydrogen sulfide and is "cascaded" to the hydrodesulfurization zone (column 8, lines 3-15). Hydrogen-rich gas may flow countercurrent to the liquid-phase hydrocarbons through one or more reaction zones (column 8, lines 26-33).

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Applicant's arguments filed January 18, 2001 have been fully considered but they are not persuasive.

Applicants argue

[t]he claims, as now amended, require a very low treat gas rate such that the moles of hydrogen per mole of chemical hydrogen consumption be less than 3. This is not suggested by Harrison et al. For example, the moles of hydrogen required in the examples of the Harrison et al. process range from 3.7 moles of hydrogen per mole of feed for example 5 to 9.3 moles of hydrogen per mole of feed for examples 2, 3, and 4. Harrison et al. prefers a range from about 3 to 7. The present invention is operated in such a way that very low rates of hydrogen are required compared to conventional multi-stage hydrodesulfurization, such as that of Harrison et al. (Remarks, pages 4 and 5). Applicants' argument lack merit.

As acknowledged by Applicants, Harrison et al prefers a hydrogen ratio of about 3 to 7 (column 10, lines 3-15). Applicants' claims to a process wherein the hydrogen ratio is "less than or equal to 3" are anticipated by Harrison et al. at a ratio of 3 and for values slightly less than 3 which are encompassed by the "about 3" ratio taught by Harrison et al. Ratios slightly less than "about 3" would have been obvious to one having ordinary skill in the art. Accordingly, applicants' claims if not anticipated by 35 U.S.C. § 102, would have been obvious under 35 U.S.C. § 103.

Applicants argue

Haun et al., which also relates to a multi-stage hydrodesulfurization process, requires that a hydrogen-rich stream from the first stage be recycled back to the first stage. This is not required in the instantly claimed invention wherein hydrogen for the first stage is cascaded from a downstream stage, primarily the final or aromatic hydrogenation stage. (Remarks, page 6).

Applicants' argument lacks merit.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Haun et al. has not been relied on for the above cited teaching. Those teachings are provided in Harrison et al.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

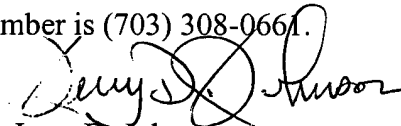
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry D. Johnson whose telephone number is (703) 308-2515. The examiner can normally be reached on 6:00-3:30, M-F, alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on (703) 308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Jerry D. Johnson  
Primary Examiner  
Art Unit 1764

JDJ  
February 4, 2002